ORDER NO. HAD84072864C2

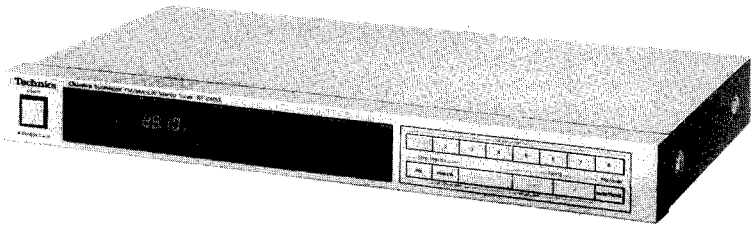
Service Manual

Tuner

QUARTZ Synthesizer FM/MW/LW Stereo Tuner ST-Z400

Color

(K)...Black Type
(S)...Silver Type



Color	Area
(K)(S)	[EX]...Scandinavia and Switzerland.
(K)(S)	[EK]...United Kingdom
(S)	[EF]...France
(K)(S)	[EB]...Belgium

SPECIFICATION
(DIN 45 500)

■ FM TUNER SECTION

Frequency range	87.50~108.00 MHz
Sensitivity	
S/N 30 dB	1.0 μV (75Ω)
S/N 26 dB	0.9 μV (75Ω)
S/N 20 dB	0.8 μV (75Ω)
IHF usable sensitivity	0.95 μV (IHF '58)
IHF 46 dB stereo quieting sensitivity	22 μV/75Ω
Total harmonic distortion	
MONO	0.15%
STEREO	0.3%
S/N	
MONO	69 dB (75 dB, IHF)
STEREO	64 dB (70 dB, IHF)
Frequency response	5 Hz~18 kHz, +0.5 dB~ −1.5 dB
Alternate channel selectivity	
normal ±400 kHz	60 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	55 dB
IF rejection at 98 MHz	90 dB
Spurious response rejection at 98 MHz	80 dB
AM suppression	55 dB
Stereo separation	
1 kHz	45 dB
10 kHz	30 dB
Carrier leak	
19 kHz	−40 dB (−45 dB, IHF)
38 kHz	−40 dB (−45 dB, IHF)
Channel balance (250 Hz~6,300 Hz)	±1 dB
Limiting point	1.0 μV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminals	
For United Kingdom	75Ω(unbalanced), 300Ω(balanced)
For others	75Ω (unbalanced)

■ AM TUNER SECTION

Frequency range	
MW	522~1611 kHz
LW	155~353 kHz
	153~351 kHz (−2 kHz shift)
Sensitivity (S/N 20 dB)	
MW at 999 kHz	20 μV, 300 μV/m
LW at 254 kHz	100 μV
Selectivity (±9 kHz)	
MW at 999 kHz	55 dB
LW at 254 kHz	55 dB
Image rejection	
MW at 999 kHz	40 dB
LW at 254 kHz	40 dB
IF rejection	
MW at 999 kHz	60 dB
LW at 254 kHz	50 dB

■ GENERAL

Output voltage	0.4V
Power consumption	9W
Power supply	
For United Kingdom	AC 50 Hz/60 Hz, 240V
For continental Europe	AC 50 Hz/60 Hz, 220V
Dimensions (W×H×D)	430 × 53 × 240 mm
	(16-15/16" × 2-3/32" × 9-7/16")
Weight	2.1 kg, (4.6 lb.)

(Specifications are subject to change without notice for further improvement.)

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

ST-Z400

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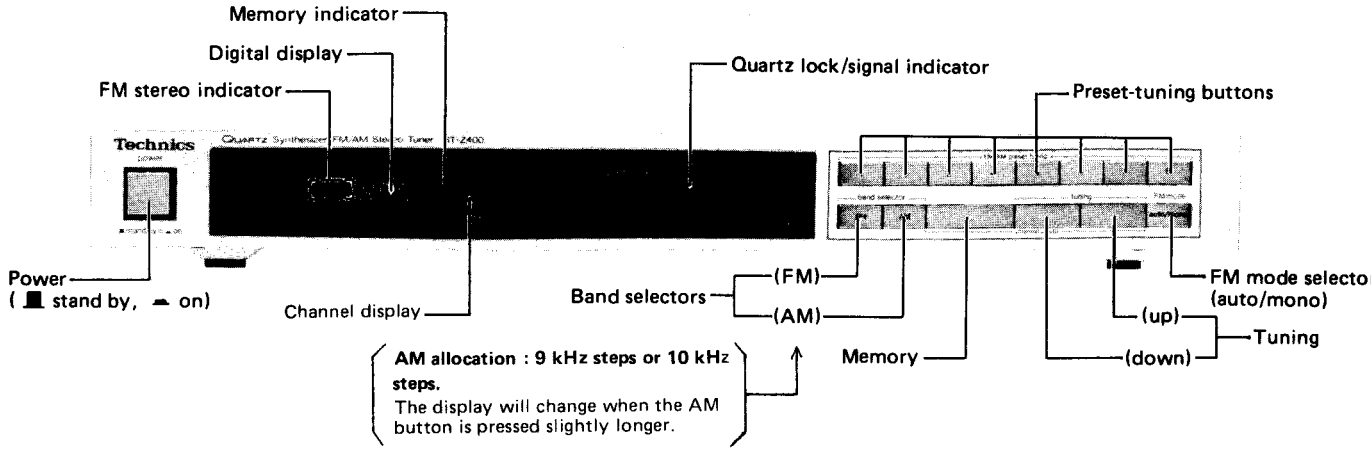
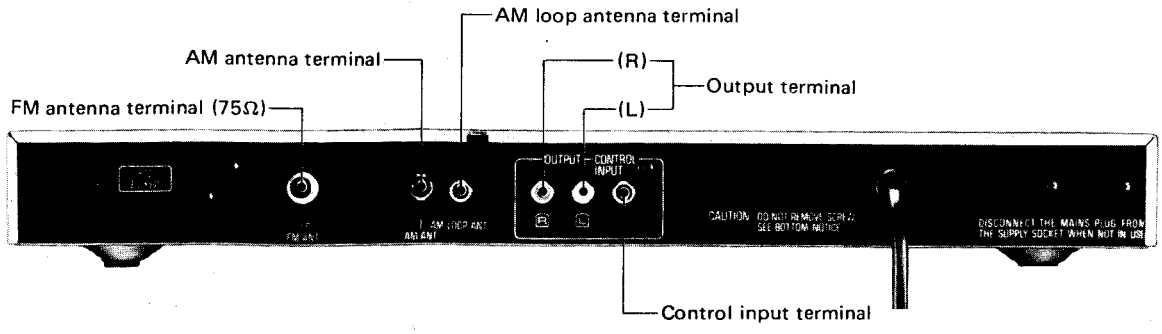
■ LOCATION OF CONTROLS





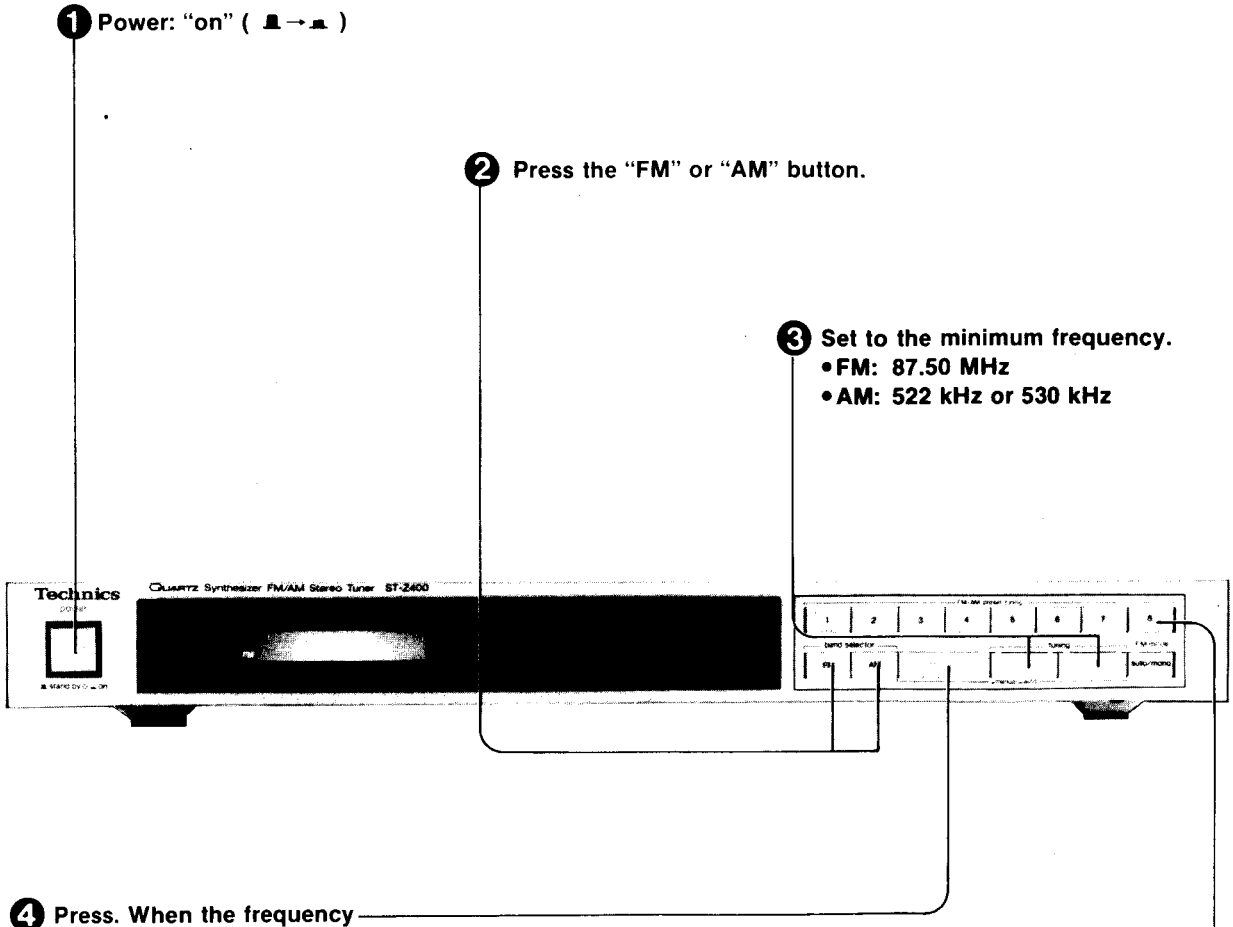
■ HOW TO PRESET RADIO BROADCAST FREQUENCIES

This unit can be used to preset as many as 16 radio broadcast frequencies: 8 FM and 8 AM. After broadcast frequencies have been preset as described below, any desired station can be quickly and easily selected by simply touching one button.

Automatic memory presetting

Beginning at the frequency indicated by the digital display, the broadcasting stations will be automatically preset to "channels" 1 through 8.

Note that in mountainous or remote areas, broadcasting stations which have weak broadcasting signals cannot be automatically preset into the memory.


1 Power: "on" (→)
2 Press the "FM" or "AM" button.
3 Set to the minimum frequency.
• FM: 87.50 MHz
• AM: 522 kHz or 530 kHz
Technics
Quartz Synthesizer FM/AM Stereo Tuner ST-Z400
4 Press. When the frequency indication begins to change, release.

(The frequency will change upward, and the automatic presetting will begin with the broadcasting station of the lowest frequency and will continue in order.)

5 Confirm the names (call signs, etc.) of the broadcasting stations which are preset to each channel, and enter them on the file sheet.

Notes:

1. In areas where there are less than 8 FM stations, the remaining channels (through channel 8) will be left empty. The empty channels can be filled by using manual memory presetting.
2. If a new broadcasting station is preset into a channel, the broadcasting station which was previously entered in that channel will be automatically erased.

Manual memory presetting

Stations can be freely preset to any desired channel.

1 **Power: "on" (▲→▲)**

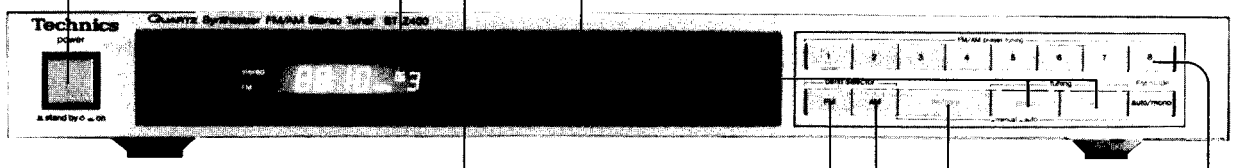
2 **Press the "FM" or "AM" button.**

3 **Press the appropriate tuning button to tune to the desired broadcast.**

- **Auto tuning**
  Press the button. When the frequency indication begins to change, release the button (a broadcasting station will be selected automatically). Repeat this operation until the desired station is found.

- **Manual tuning**
  Press the button momentarily and tune to the desired station (the frequency will change each time the button is pressed).

Memory indicator



4 **Press momentarily, and then release.**
(The memory indicator will illuminate for approximately 4 seconds.)

Note:
If the button is pressed continuously, the frequency will begin to change, and the memory will be preset automatically.
To stop the automatic memory presetting, once again press either the "up" button or the "down" button.

5 **While the memory indicator is illuminated, press the button of the desired channel.**
When the button is pressed, the memory indicator illumination will stop, and the presetting is complete.

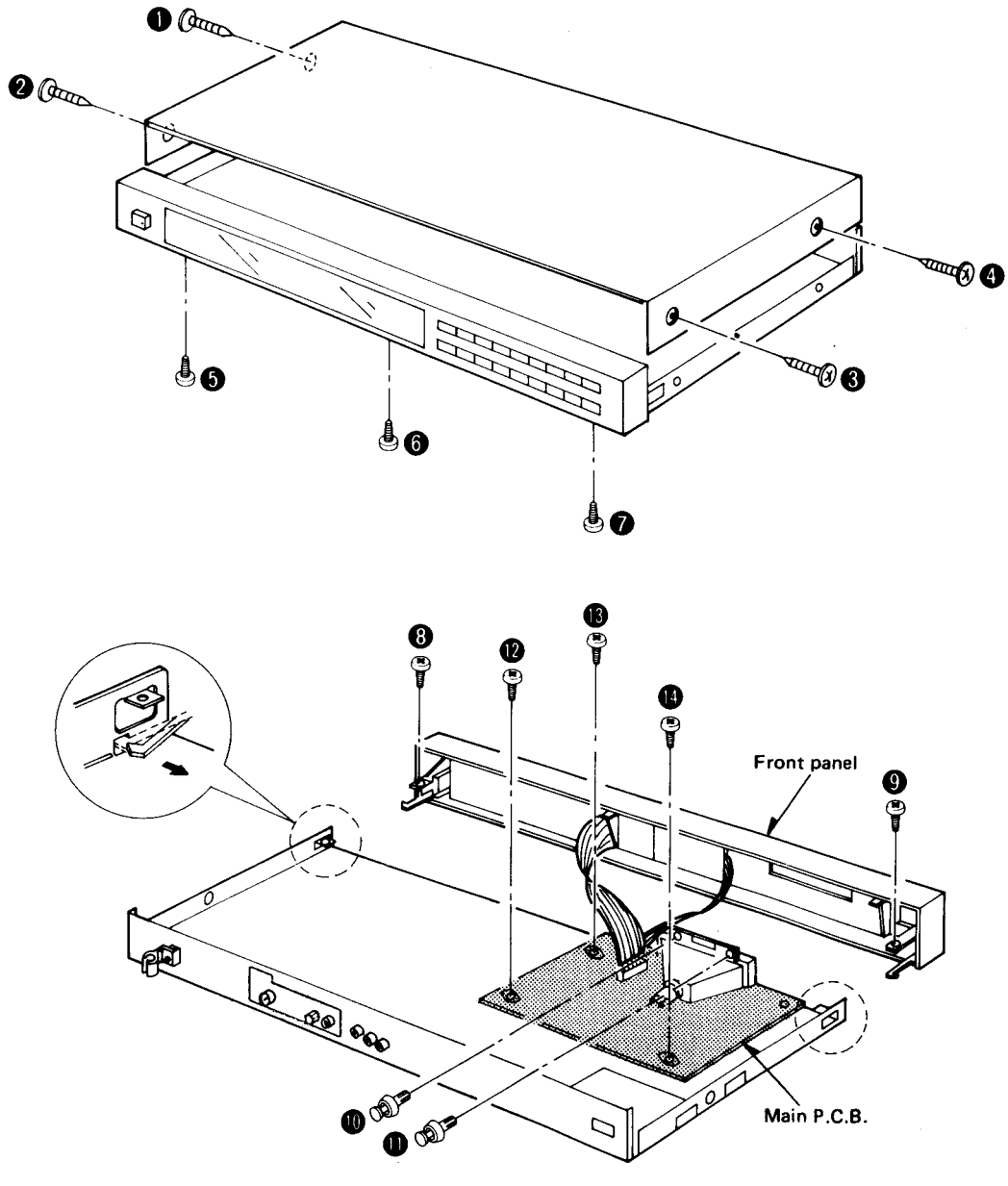
Note:
1. If the memory indication illumination stops before you press the button, once again repeat step (4) and then step (5).
2. If a new broadcasting station is preset into a channel, the broadcasting station which was previously entered in that channel will be automatically erased.

6 **Enter the name (call sign, etc.) of the preset broadcasting station on the station memory file sheet.**
This completes the procedures for presetting radio broadcast frequencies. The other preset-tuning buttons can be preset in the same way by following steps (2) through (5).

■ DISASSEMBLY INSTRUCTIONS

Ref. No. 1	How to remove the main P.C.B.

(1) Remove 4 screws (❶ ~ ❹).
(2) Remove 5 screws (❺ ~ ❾) of front panel.
(3) Remove the 2 rivets (❿ , ⓫) and 3 screws (⓬ ~ ⓮) of main P.C.B.



■ BEFORE REPAIR

The power switch of this unit is located on the secondary side of the power transformer. Be sure to disconnect the power cord from the socket before servicing. Also, do the following before repair of digital circuits.

(1) Disconnect the power cord from the socket.
(2) Using a 10Ω, 1W resistor, short circuit electrolytic "gold" capacitors C902 and C903 momentarily to discharge them.

■ MEASUREMENTS AND ADJUSTMENTS

Note: AM OSC coil (L203), AM IFT (T201) and LW antenna coil (L251) have been already adjusted, and require no adjustment.

AM ADJUSTMENT

*** Setting and Equipment used**

1. AC and DC electronic voltmeters (EVM)
2. AM signal generator (AM-SG).
3. Set Band selector to "MW/LW" position.
4. Maintain line voltage at rated voltage.
5. Output of signal generator should be no higher than necessary to obtain an output reading.
6. Use a non-metal screwdriver for the adjustment.

Step No.	AM SIGNAL GENERATOR CONNECTION	AM SIGNAL GENERATOR FREQUENCY	DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	MW-RF ADJUSTMENT * Set band selector to "MW" position.					
1	Connect AM-SG to AM antenna terminal through 200 pF capacitor. Common to chassis. (Weak input)	612 kHz (30% Mod. with 400 Hz)	612 kHz	Connect AC EVM or scope to "OUTPUT" terminals.	L202 (ANT. Coil)	1. Adjust for maximum output. 2. Adjust core of L202 by screwdriver.
2		1503 kHz (30% Mod. with 400 Hz)	1503 kHz	Connect AC EVM or scope to "OUTPUT" terminals.	CT201 (ANT. Trimmer)	1. Adjust for maximum output. 2. Repeat steps (1) and (2) until the frequency correctly matches the frequency display.
	LW-RF ADJUSTMENT * Set band selector to "LW" position.					
3	Connect AM-SG to AM antenna terminal through 200 pF capacitor. Common to chassis. (Weak input)	155 kHz (30% Mod with 400 Hz)	155 kHz	Connect AC EVM or scope to "OUTPUT" terminals.	L252 (OSC. Coil)	1. Adjust for maximum output. 2. Adjust core of L252 by screwdriver.
4		353 kHz (30% Mod. with 400 Hz)	353 kHz	Connect AC EVM or scope to "OUTPUT" terminals	CT251 (ANT. Trimmer)	1. Adjust for maximum output. 2. Repeat steps (3) and (4) until the frequency correctly matches the frequency display.

FM ADJUSTMENT

*** Setting and Equipment used**

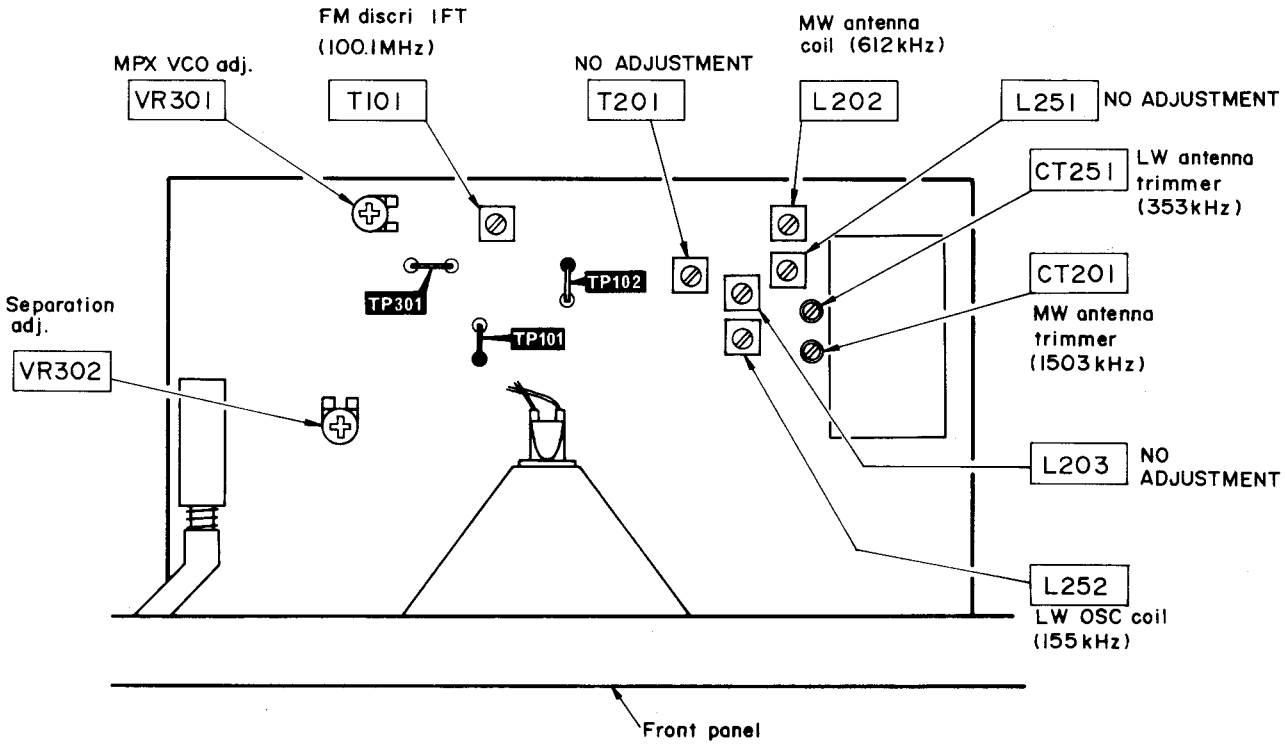
1. FM signal generator (FM-SG).
2. Stereo modulator.
3. Oscilloscope.
4. AC and DC electronic voltmeters (EVM).
5. Frequency counter (19 kHz and 108 MHz measurable).
6. Low-pass filter (fc : 15 kHz ~ 19 kHz).
7. Set Band selector to "FM" position.
8. Set FM mode switch to "mono" position.

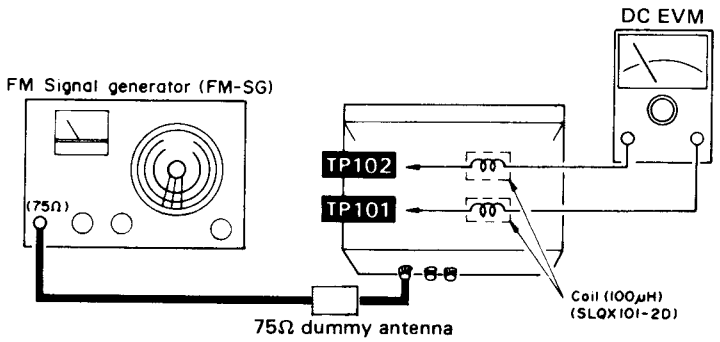
*** Preparation of FM signal generator (FM-SG)**

1. Apply SG output to antenna terminal of the set through 75Ω FM dummy antenna.
2. The standard input of the set is 60 dB (1 mV), 400 Hz, 100% modulation [Because of using dummy antenna, SG output must be 12 dB (4μV) plus (IHF). That is, when input 60 dB (1 mV), SG output is to be 72 dB (4 mV)].
3. Connect stereo modulator to FM-SG.

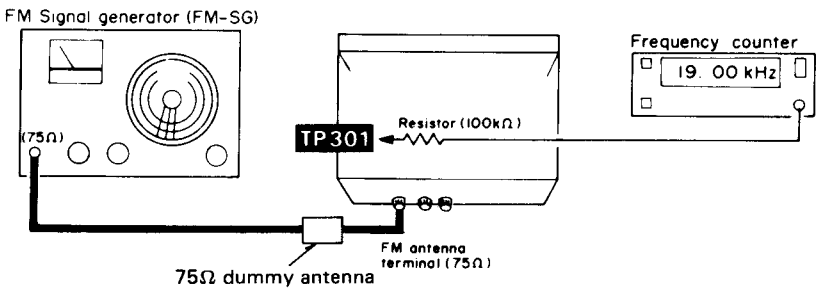
	FM SIGNAL GENERATOR CONNECTION	FM SIGNAL GENERATOR FREQUENCY	DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	FM-IF ADJUSTMENT					
5	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Apply 60 dB (1 mV) to antenna terminal)	100.1 MHz (90% Mod. with 400 Hz)	100.1 MHz	Connect DC EVM to between TP101 (–) and TP102 (+) through chock coil. (Refer to Fig. 1)	T101 (Discri. IFT)	Adjust T101 core so that voltage measured in signal mode is 0 mV in 300 mV range.
	FM MPX V.C.O. ADJUSTMENT					
	USING A FREQUENCY COUNTER			USING ALTERNATE SYSTEM		
6	1. 100.1 MHz, 60 dB Non-modulated mono signal applied to set. (Fig. 2) 2. FM mode switch to "auto" position. 3. Connect frequency counter to TP301 through resistor (100kΩ). 4. Adjust **VR301** to 19 kHz ± 30 Hz.			1. Apply stereo signal from generator or stereo station to tuner. 2. Adjust **VR301** until stereo indicator lights up. Cement arm of **VR301** as shown in Fig. 3.		
	SEPARATION ADJUSTMENT					
7	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1 MHz (100% Mod. with 1 kHz L or R mode)	100.1 MHz	Connect AC EVM to "OUTPUT" terminals of the set through low-pass filter. (fc = 15 kHz ~ 19 kHz)	VR302 (Separation)	1. Set the FM mode switch to "auto". 2. Adjust VR302 so that R output is minimized when stereo modulator is in L (L ch. modulation) mode and that L output is minimized in R mode.

- **Adjustment locations**

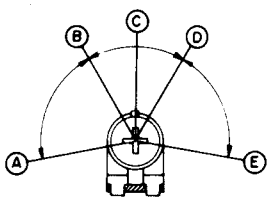




[Fig. 1] (Adjustment of FM offset)



[Fig. 2] (Adjustment of FM MPX VCO)



VR301 (10kΩ)

Ⓐ–Ⓑ,Ⓓ–Ⓔ : Stereo OFF position.
Ⓑ–Ⓓ : Stereo ON position.
(indicator lighting)
Ⓒ : Adjust point of pilot circuit

[Fig. 3] (Adjustment of FM MPX VCO)

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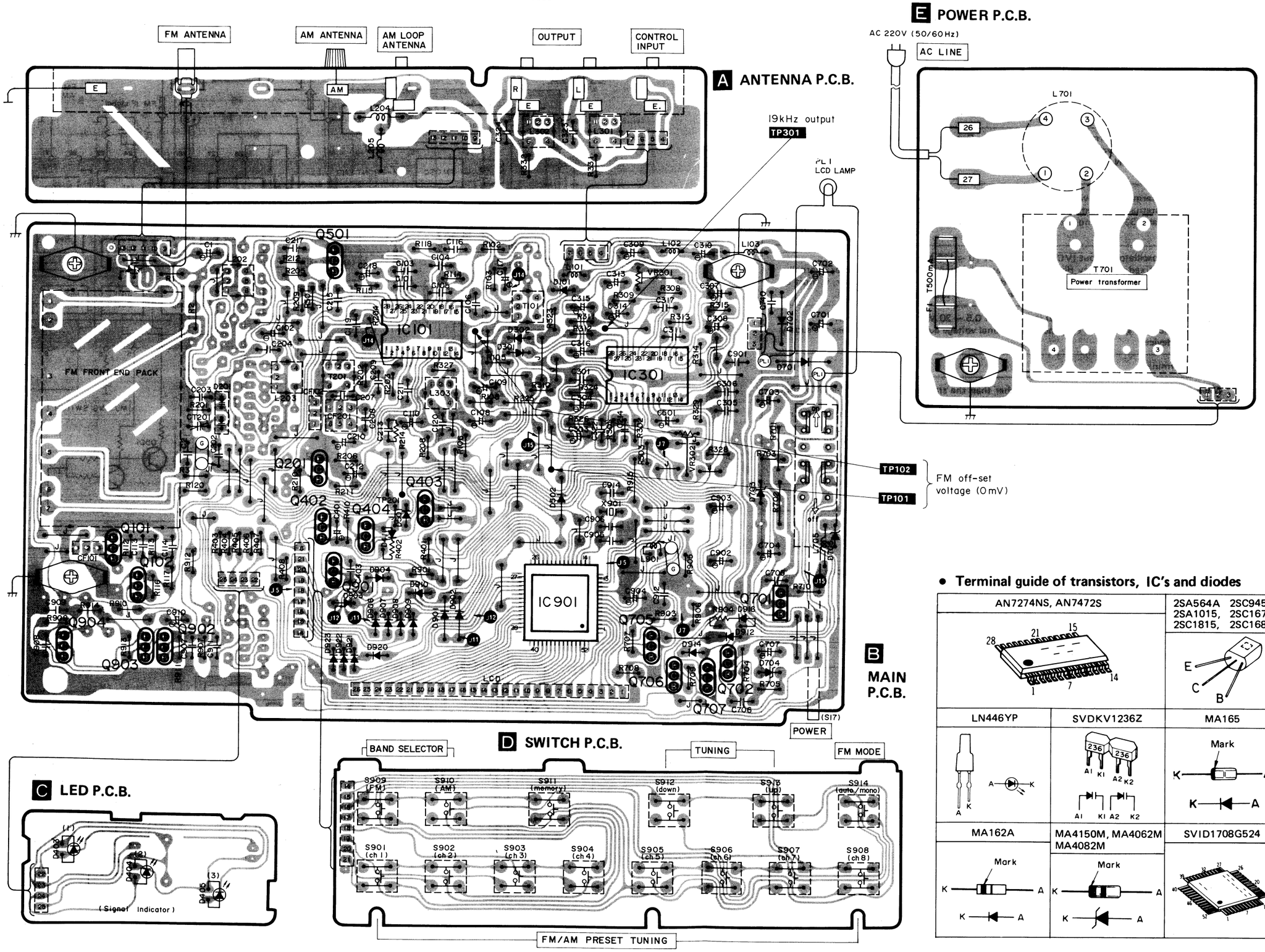
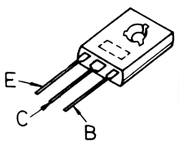
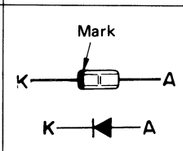
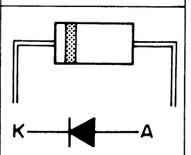
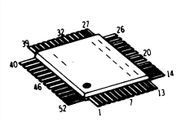
■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM



• Terminal guide of transistors, IC's and diodes

AN7274NS, AN7472S		2SA564A 2SC945 2SA1015, 2SC1675 2SC1815, 2SC1685	2SD882
			
LN446YP	SVDKV1236Z	MA165	SVDSR1K2
			
MA162A	MA4150M, MA4062M MA4082M	SVID1708G524	
			

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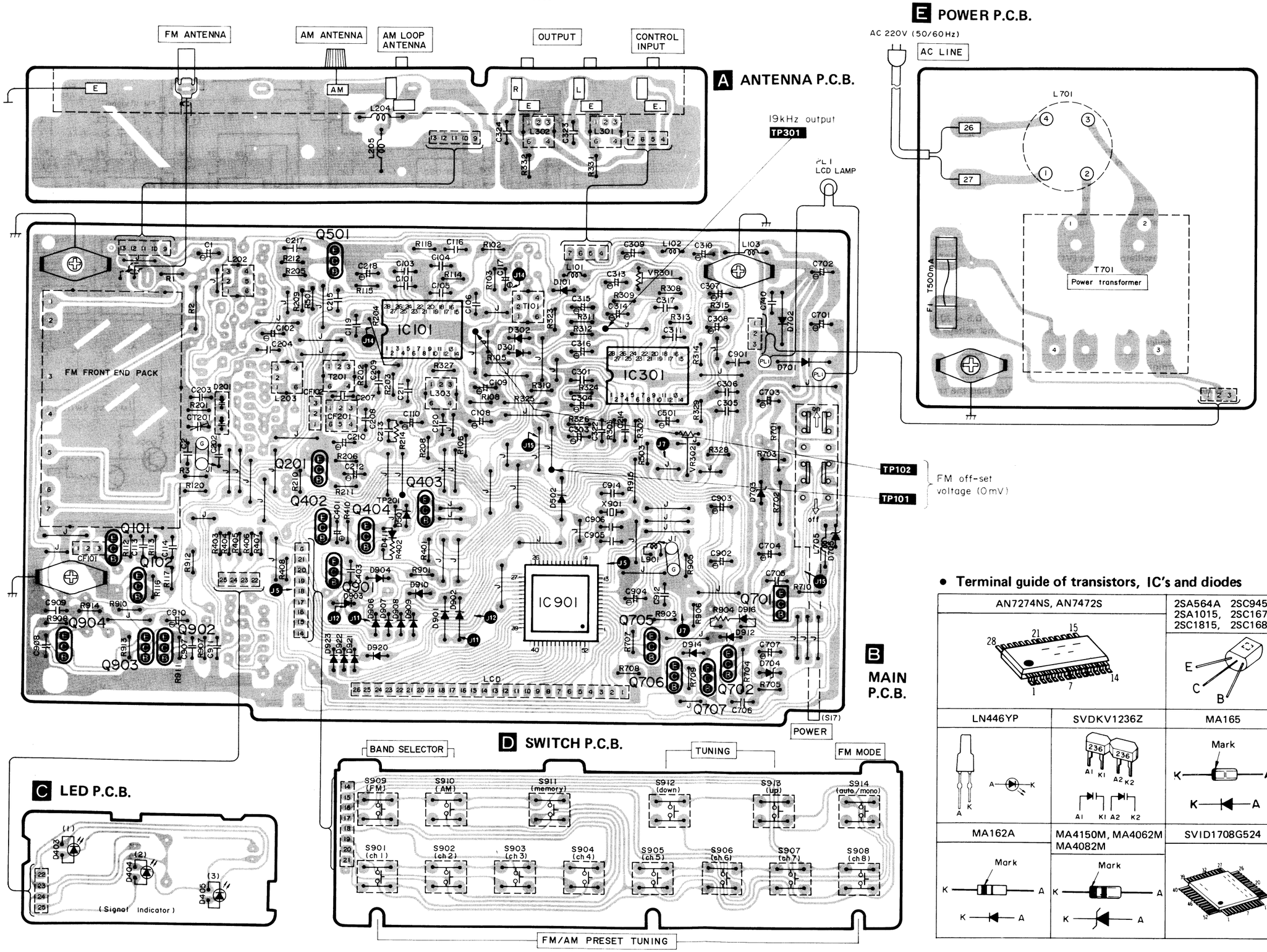
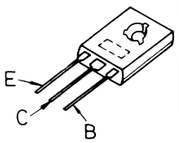
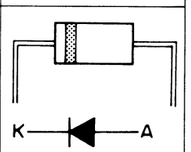
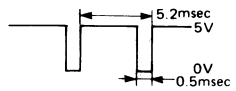
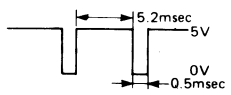
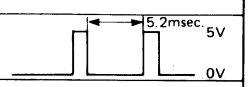
■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM



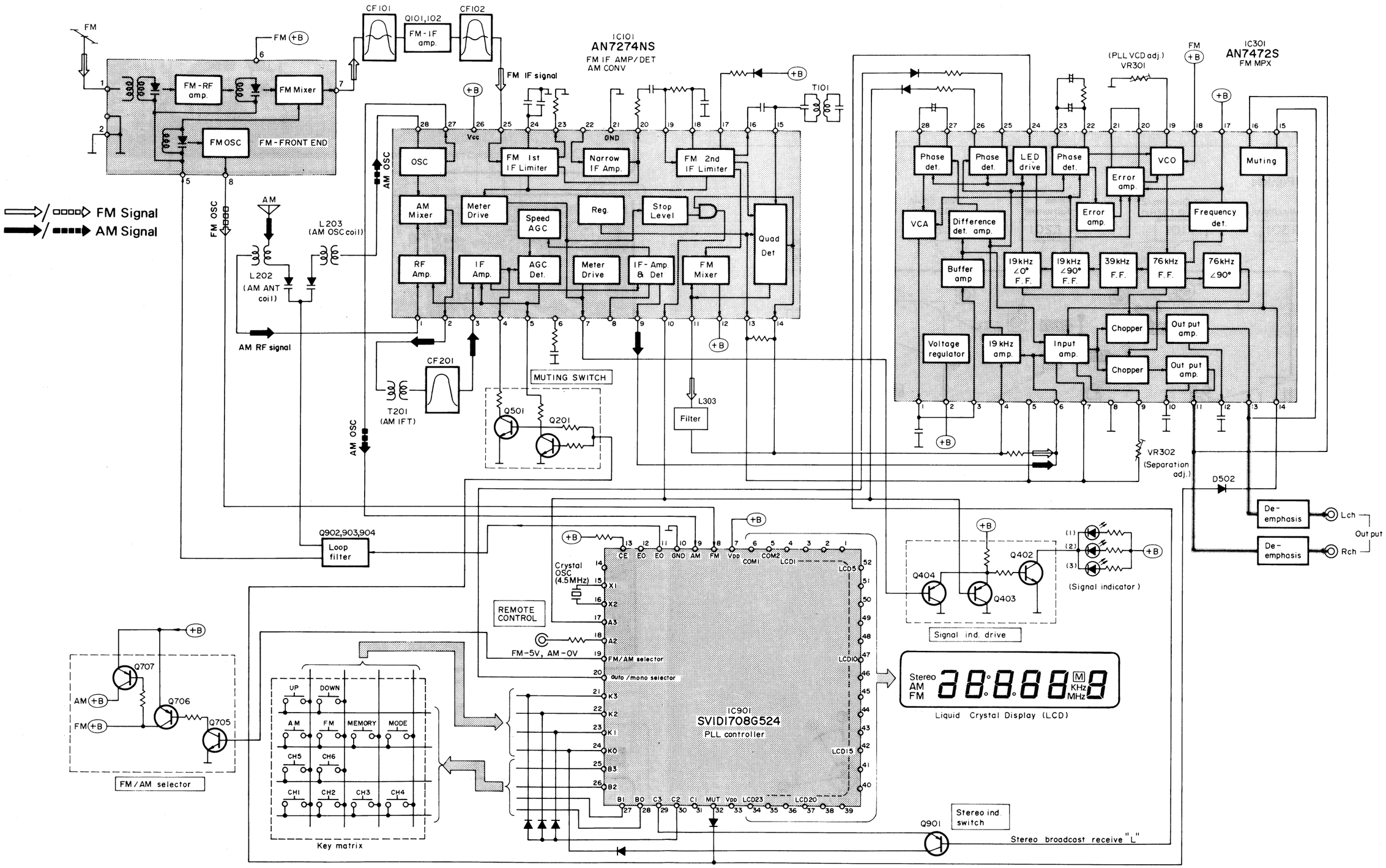
• Terminal guide of transistors, IC's and diodes

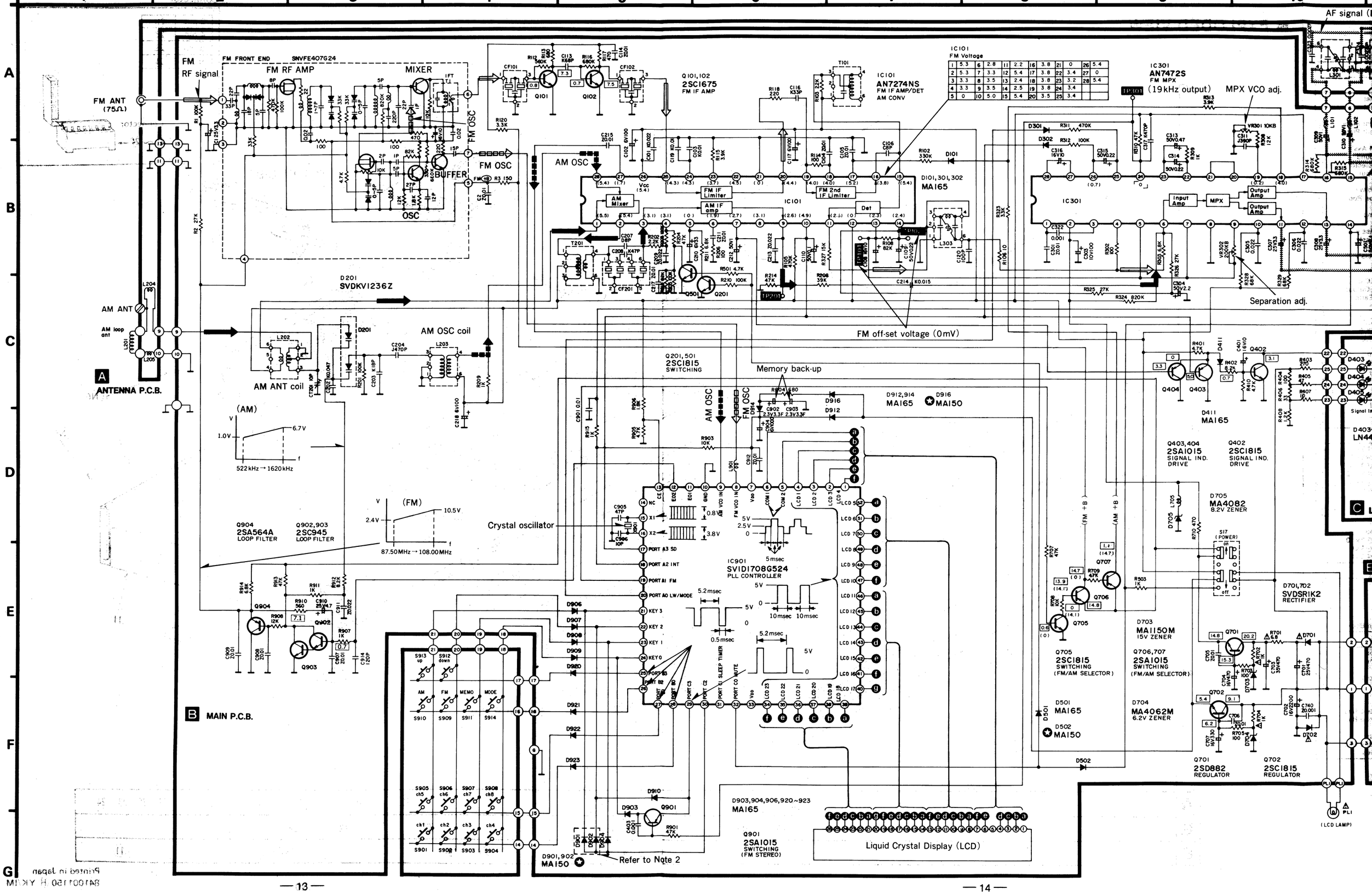
AN7274NS, AN7472S		2SA564A 2SC945 2SA1015, 2SC1675 2SC1815, 2SC1685	2SD882
			
LN446YP	**SVDKV1236Z**	**MA165**	**SVDSR1K2**
			
MA162A	**MA4150M, MA4062M MA4082M**	**SVID1708G524**	

■ FUNCTION OF TERMINAL (PLL controller IC901)

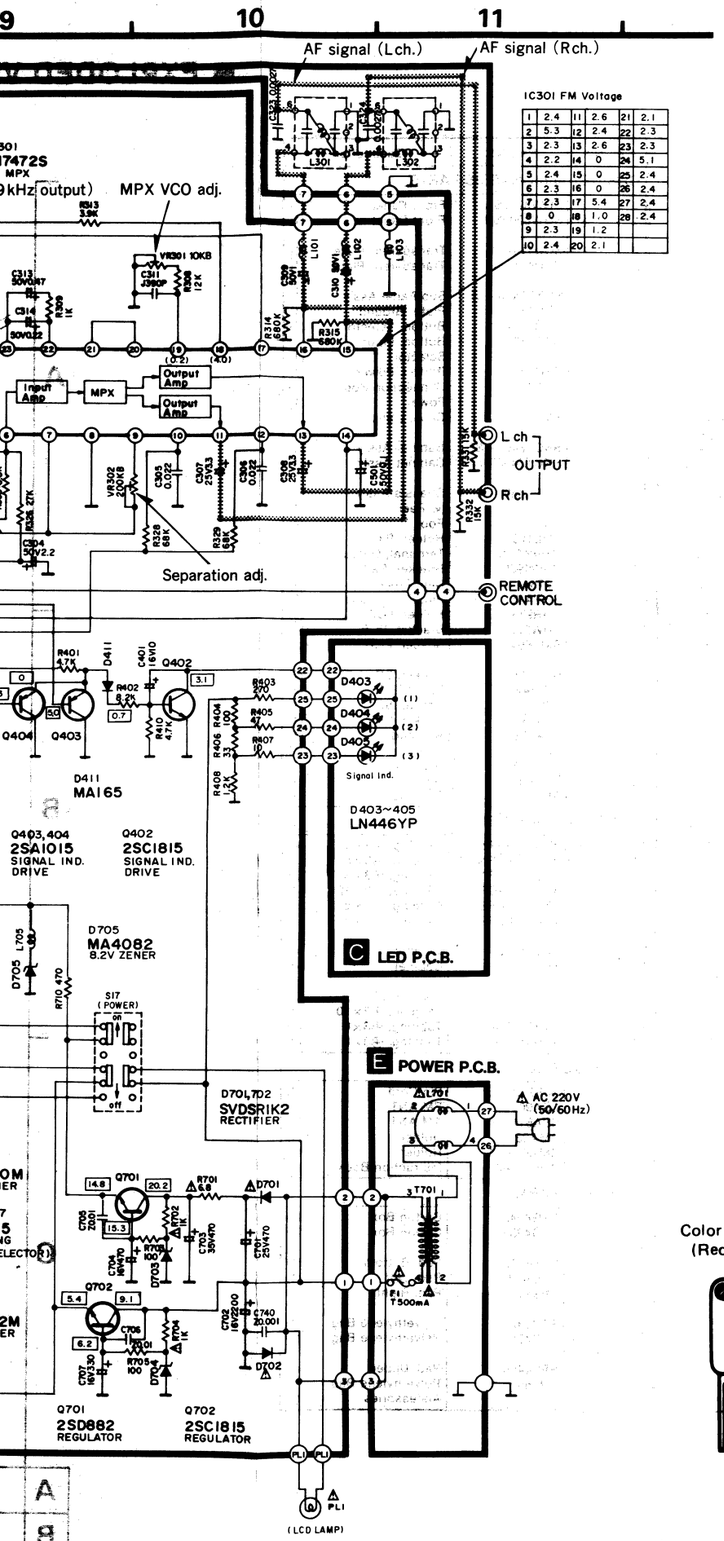
Pin No.	Mark	Description of terminal
1 ≀ 4 34 ≀ 52	LCD4 ≀ LCD1 LCD23 ≀ LCD5	Segment signal output terminal for display.
5	COM2	Common signal output terminal connected to LCD. Output is delivered in 3 values of ground, $1/2V_{DD}$ and V_{DD} (at 5ms intervals) in a period of 50 Hz. The segment turns ON when the difference in voltage is $\pm V_{DD}$ between these terminals and LCD1 ~ LCD23.
6	COM1	
7	V_{DD}	Power supply terminal of device. Voltage of 5V ± 10% is supplied during operation of device. To hold the internal data memory (RAM), the voltage can be decreased to 2.5V. **Note:** Pins 7 and 33 are connected inside the chip. It is unnecessary to supply voltage to the pins.
33	V_{DD}	
8	FM	Input is local oscillator output (VCO) in a range of 10 ~ 130 MHz (0.3Vp-p, min.). There are 1/2 fixed frequency division prescaler and 2-step (1/32, 1/33) prescaler internally. Therefore, when deciding the frequency dividing value of programmable divider, it must be decided from the frequency obtained by halving the local oscillator output (VCO).
9	AM	Input is local oscillator output (VCO) in a range of 0.5 ~ 20 MHz (0.1Vp-p, min.). When the mode is shifted to FM, the AM terminal voltage automatically becomes the supply voltage of device.
10	GND	Ground terminal.
11	E01	When the divided oscillator frequency is higher than the standard frequency, H-level output is delivered from these terminals. When it is lower, L-level (0V) output is delivered. When they coincide, it results in floating.
12	E02	
13	CE	Device selection signal input terminal. The signal level should be high when the device is operated, and low when not operated. With this terminal shifted to low level, LCD (liquid crystal display) turns off and the memory is held.
14	NC	Not used in this unit.
15	X1	Connecting terminal for crystal oscillator. The crystal connected is 4.5 MHz.
16	X2	
17	A3 (SD)	Terminal to put in stop signal during auto tuning. The voltage is 5V with broadcast received, and 0V without broadcast received.
18	A2	This is the interrupt demand signal input terminal. The signal from the control input terminal is put into this terminal, demanding for interruption, then the flow of program will be unconditionally shifted to the address No. 1.
19	A1	FM/AM output terminal. (FM → 5V, AM → 0V)
20	A0	Auto/mono changeover output terminal. (auto → 0V, mono → 5V)
21 ≀ 24	K3 ≀ K0	Input terminal for key return signal from external key matrix. 
25 ≀ 28	B3 ≀ B0	Output terminal for key return signal to external key matrix. 
29	C3	Terminal for FM IF ceramic filter frequency compensation. A pulse is generated when the voltage of terminal 13 rises.
30	C2	Output terminal for key return signal to let the stereo indicator light up. 
31	C1	Nut used in this unit.
32	C0	Muting signal output terminal. Muting signal is delivered during operation of FM/AM selector switch and tuning switch. (4V during muting)

■ BLOCK DIAGRAM





Printed in Japan
8A10011150 H YK1M



■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. with ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement part, please use the part No. in the replacement part list.

Note 1:

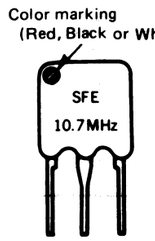
1. **S17** : Power source switch in "**on**" position.
2. **S901 ~ S908** : Preset tuning switch.
   * With it momentarily pushed (less than 0.4 sec.) and released, the 1 ~ 8 CH are received.
   * With it continuously pused (0.4 sec. or more) and released, the 9 ~ 16 CH are received.
3. **S909** : FM selector switch.
4. **S910** : AM selector switch.
5. **S911** : Memory set switch. (manual ⟷ auto memory)
6. **S912** : Tuning (down) switch.
   [down: tuning to lower frequency]
7. **S913** : Tuning (up) switch.
   [up: tuning to higher frequency]
8. **S914** : FM mode switch. (stereo ⟷ mono)
9. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
   * Figures in ☐ stand for DC voltage in FM signal (no signal) reception mode.
   * Figures in ⌜ ⌟ stand for DC voltage in FM stereo signal reception mode.
   * Figures in ( ) stand for DC voltage in AM signal reception mode.
10. ——— Positive voltage lines ▒▒▒ AF signal lines
    ⇨ FM signal ▫▫▫▷ FM OSC ➡ AM signal ▪▪▪▶ AM OSC
11. Important safety notice.
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified aprts.

Note 2:

• Use of ceramic filters in pairs

The ceramic filters (CF101, CF102) for FM-IF circuit are available in three ranks. For this circuit , be sure to use the ceramics of the same rank in a pair.

At repairing and replacement, pay close attention to the diodes (D901, D902) for use as different diodes must be used depending on each rank of the ceramic filters.

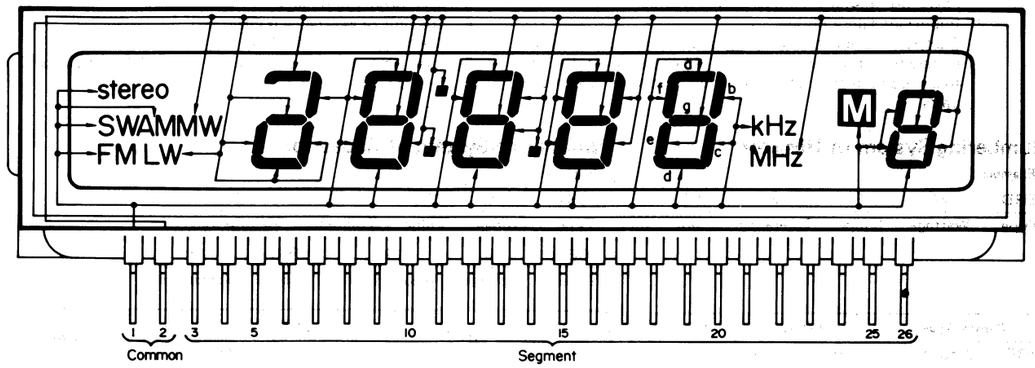


RANK (Color)	D901	D902	CENTER FREQUENCY
Black	O	X	10.65 MHz
Red	X	X	10.70 MHz
White	X	O	10.76 MHz

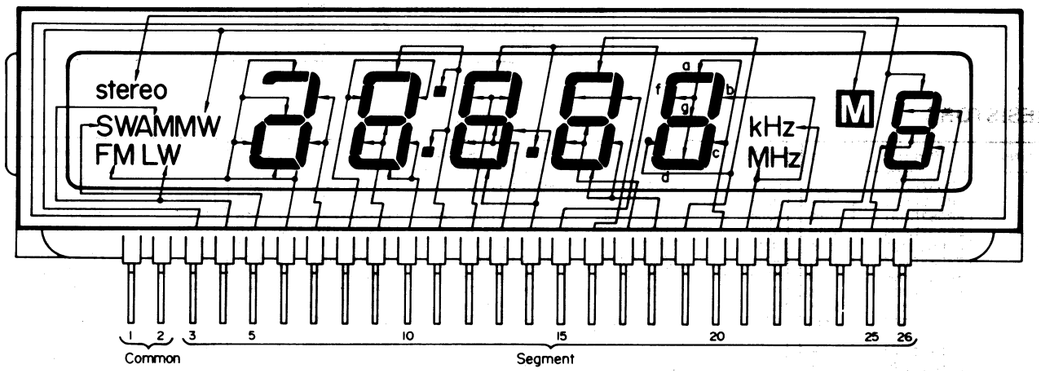
Note: O Mark Diode is used.
X Mark Diode is not used.

■ LIQUID CRISTAL DISPLAY (LCD)

• Common terminal (No. 1, 2)



• Segment terminal (No. 3 ~ 26)



■ RESISTORS AND CAPACITORS

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice.
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. The "Ⓢ" mark is service standard parts and may differ from production parts.
4. The unit of resistance is OHM (Ω).
K = 1000Ω M = 1000kΩ
5. The unit of capacitance is MICROFARAD (μF)
P = 10^{-6} μF

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Resistor Type	Wattage	Tolerance
ERD : Carbon	25 : 1/4W S2 : 1/4W	J : ±5%

Capacitor Type	Voltage				Tolerance
	ECEA Type		Other		
ECEA : Electrolytic	0J	: 6.3V	1H	: 50V DC	C : ±0.25pF
ECCD : Ceramic	1A	: 10V	2H	: 500V DC	J : ±5%
ECKD : Ceramic	1C	: 16V	2R3	: 2.3V DC	K : ±10%
ECQM : Polyester	1E	: 25V			Z : +80%, −20%
ECQP : Polypropylene	1H	: 50V			
EECW : Liquid electrolyte double layer capacitor	50	: 50V			
	25	: 25V			

● RESISTORS

Ref. No.	Part No.	Value
R1	ERDS2TJ104	100K
R2	ERDS2TJ273	27K
R3	ERDS2TJ151	150
R102	ERDS2TJ334	330K
R103	ERDS2TJ222	2.2K
R105	ERDS2TJ474	470K
R106	ERDS2TJ100	10
R108	ERDS2TJ823	82K
R112	ERDS2TJ564	560K
R113	ERDS2TJ681	680
R114	ERDS2TJ101	100
R115	ERDS2TJ392	3.9K
R116	ERDS2TJ684	680K
R117	ERDS2TJ471	470
R120	ERDS2TJ332	3.3K
R201	ERDS2TJ104	100K
R202	ERDS2TJ222	2.2K
R203	ERDS2TJ124	120K
R204	ERDS2TJ473	47K
R205	ERDS2TJ104	100K
R206	ERDS2TJ101	100
R208	ERDS2TJ393	39K
R209	ERDS2TJ102	1K
R210	ERDS2TJ104	100K
R211	ERDS2TJ682	6.8K
R212	ERDS2TJ823	82K
R214	ERDS2TJ473	47K
R302	ERDS2TJ101	100
R303	ERDS2TJ682	6.8K
R308	ERDS2TJ123	12K
R309	ERDS2TJ102	1K
R310	ERDS2TJ473	47K
R311	ERDS2TJ474	470K
R312	ERDS2TJ104	100K
R313	ERDS2TJ392	3.9K
R314, 315	ERDS2TJ684	680K
R323	ERDS2TJ332	3.3K
R324	ERDS2TJ824	820K
R325	ERD25TJ273	27K
R326	ERDS2TJ273	27K
R327	ERDS2TJ153	15K
R328, 329	ERDS2TJ683	68K
R331, 332	ERDS2TJ153	15K
R401	ERDS2TJ472	4.7K
R402	ERDS2TJ822	8.2K
R403	ERDS2TJ271	270
R404	ERDS2TJ101	100
R405	ERDS2TJ470	47
R406	ERDS2TJ330	33
R407	ERDS2TJ100	10
R408	ERDS2TJ122	1.2K
R410	ERDS2TJ472	4.7K
R501	ERDS2TJ473	47K
R503	ERDS2TJ102	1K
R701 Ⓢ ⚠	ERD25FJ6R8	6.8
R702 Ⓢ ⚠	ERD25FJ102	1K
R703	ERDS2TJ101	100
R704 Ⓢ ⚠	ERD25FJ102	1K
R705	ERDS2TJ101	100
R901	ERDS2TJ473	47K
R903	ERDS2TJ103	10K
R904	ERDS2TJ681	680
R905	ERDS2TJ472	4.7K
R906	ERDS2TJ182	1.8K
R907	ERDS2TJ102	1K
R908	ERDS2TJ123	12K
R910	ERDS2TJ561	560
R911	ERDS2TJ102	1K
R912	ERDS2TJ822	8.2K
R913	ERDS2TJ473	47K
R914	ERDS2TJ682	6.8K
R915 Ⓢ	ERD25FJ102	1K

● CAPACITORS

Ref. No.	Part No.	Value
C1	ECEA1EU3R3	3.3
C2 Ⓢ	ECKD1H103ZF	0.01
C101	ECQM1H223JZ	0.022
C102	ECEA0JU101	100
C103	ECQM1H103JZ	0.01
C104, 105 Ⓢ	ECKD1H103ZF	0.01
C106 Ⓢ	ECCD1H080CC	8P
C108	ECEA1CU100	10
C109	ECEA1HUR22	0.22
C110	ECEA1HU0R1	0.1
C113 Ⓢ	ECCD1H680K	68P
C114 Ⓢ	ECKD1H103ZF	0.01
C116 Ⓢ	ECCD1H330K	33P
C117	ECEA0JU101	100
C119	ECQM1H103JZ	0.01
C120	ECCD1H101K	100P
C202	ECQM1H473JZ	0.047
C203 Ⓢ	ECCD1H180KC	18P
C204	ECQP1471JZ	470P
C207 Ⓢ	ECCD1H080CC	8P
C208 Ⓢ	ECCD1H470K	47P
C209 Ⓢ	ECKD1H223ZF	0.022
C210	ECEA0JU330	33
C211 Ⓢ	ECKD1H103ZF	0.01
C212	ECEA1HU010	1
C213 Ⓢ	ECKD1H223ZF	0.022
C214	ECQM1H153JZ	0.015
C215 Ⓢ	ECKD1H103ZF	0.01
C217 Ⓢ	ECKD1H103ZF	0.01
C218	ECEA0JU101	100
C301 Ⓢ	ECKD1H103ZF	0.01
C303	ECEA1AU101	100
C304	ECEA1HU2R2	2.2
C305, 306 Ⓢ	ECQM1H223JZ	0.022
C307, 308	ECEA1EU3R3	3.3
C309, 310	ECEA1HU010	1
C311	ECQP1391JZ	390P
C313	ECEA1HUR47	0.47
C314, 315	ECEA1HUR22	0.22
C316	ECEA1CU100	10
C317 Ⓢ	ECKD1H471KB	470P
C322	ECKD1H102ZF	0.001
C323, 324	ECQM1H272	0.27
C401	ECEA1CU100	10
C403 Ⓢ	ECKD1H102ZF	0.001
C501 Ⓢ	ECEA1HU0R1	0.1
C701	ECEA1EU471	470
C702	ECEA1CU222	2200
C703	ECEA1VU471	470
C704	ECEA1CU471	470
C705, 706 Ⓢ	ECKD1H103ZF	0.01
C707	ECEA1CU331	330
C740	ECKD1H102ZF	0.001
C901 Ⓢ	ECKD1H103ZF	0.01
C902, 903 Ⓢ	EECW2R3A3R3	3.3F
C904	ECEA0JU102	1000
C905 Ⓢ	ECCD1H470K	47P
C906 Ⓢ	ECCD1H100KC	10P
C907, 908 Ⓢ	ECKD1H103ZF	0.01
C909 Ⓢ	ECKD1H103ZF	0.01
C910 Ⓢ	ECEA25M4R7R	4.7
C911 Ⓢ	ECKD1H223ZF	0.022
C912 Ⓢ	ECKD1H103ZF	0.01
C914	ECCD1H121K	120P

■ REPLACEMENT PARTS LIST

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ - marked parts are used for black only, while ○ - marked parts are for silver type only.
4. Part other then Ⓚ - and ○ - marked are use for both black and silver type.
5. The "Ⓢ" mark is service standard parts and may differ from production parts.
6. The parenthesized numbers in the column of description stand for the quantity per set.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC101	AN7274NS	FM IF Amp. FM & AM Detectotor
IC301	AN7472S	FM MPX
IC901	SVID1708G524	Micro-Computer
TRANSISTORS		
Q101, 102 Ⓢ	2SC1675−L	FM IF Amp
Q201, 402, 501, 705	2SC1815−G	Switching, Signal Ind. Drive
Q403, 404, 706, 707, 901 Ⓢ	2SA1015−Y	Signal Ind. Drive, Switching
Q701	2SD793−Q	Regulator (Product Part No. is 2SD882−Q)
Q702	2SC1815−Y	Regulator
Q902, 903 Ⓢ	2SC945−Q	Loop Filter
Q904	2SA722−S	Loop Filter (Product Part No. is 2SA564A)
DIODES		
D101, 301, 302, 411, 501, 903, 904, 906∼910, 912, 914, 920∼923	MA165	Switching
D201	SVDKV1236Z	Variable Capacitance
D403∼405	LN446YP	Signal Ind.
D502, 901, 902, 916 Ⓢ	MA162A	Switching
D701, 702 ⚠	SVDSR1K2	Rectifier
D703	MA4150M	15V Zener
D704	MA4062M	6.2V Zener
D705	MA4082M	8.2V Zener
COILS		
L101∼103, 705	SLQZ12G1−D	Choke
L202	SLA2B1−P	AM Antenna Coil
L203	SL02B7−P	AM OSC Coil
L204, 205	SLQZ12G1−D	Choke
L301, 302	SLM5B2−P	Coil
L303	SLM1B1−P	Coil
L701	SLQZ650MH49	Choke
L901	RLQY25S5−0	Choke Coil
TRANSFORMERS		
T101	SLI4B515−Z	FM Discri. IFT
T201	SLI2B104−M	AM IFT
T701 ⚠	SLT5K171	Power Transformer

Ref. No.	Part No.	Description
CERAMIC FILTERS		
CF101	SVFE107MZ2−A	FM 10.70MHz (Red)
	SVFE107MZ2−D	FM 10.65MHz (Black)
	SVFE107MZ2−E	FM 10.75MHz (White)
CF102	SVFE107MM−A	FM 10.70MHz (Red)
	SVFE107MM−D	FM 10.65MHz (Black)
	SVFE107MM−E	FM 10.75MHz (White)
CF201	SVFSFZ450F7L	AM 450kHz
CRYSTAL		
X901	SVQ49U452−T	4.5MHz
VARIABLE RESISTORS		
VR301	EVN75AA00B14	MPX VCO Adj. 10kΩ(B)
VR302	EVN58AA00B25	Separation Adj. 200kΩ(B)
VARIABLE CAPACITOR		
CT201	SVCTZ03T110F	AM ANT Trimmer
LAMP		
PL1 ⚠	XAMS15S150	LCD Lamp
FUSE		
F1 ⚠	XBA2C05TR0	250V, 500mA
SWITCHES		
S17 ⚠	SSH1069	Power
S901∼914	SSG13	Key-Board
LIQUID CRYSTAL DISPLAY		
LCD	SALHLC9150−1	Liquid Crystal Display
FM FRONT END		
	SNVFE407G22	FM Front End Pack

Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
1 ○	SGW8200SA	Front Panel (1)
1 Ⓚ	SGW8200BB	Front Panel (1)
2 ○	SGU414−2	Transparent Plate (1)
2 Ⓚ	SGU414−4	Transparent Plate (1)
3	SGXTZ400−SE	Sub Panel Ass'y (1)
4	SUS759−1	Plate, Ground (1)
5	SBC661A	Button, Selector (1)
6	SBC660A	Button, Input Selector (1)
7	SBC627	Button, Power (1)
8	SUB201	Connection Rod, Power (1)
9	SMP376	Case, Lamp (1)
10 ○	SKCTZ400−SE	Cabinet Ass'y (1)
10 Ⓚ	SKCTZ400−KE	Cabinet Ass'y (1)
11	SGPTZ400−SG	Chassis Ass'y (w/Feet) (1)
11-1	SKL293	Foot (4)
13	SHE170	Holder, P.C.B. (5)
14	SJF8609N	Terminal, Output (1)
15	SUW1959	Bracket, Earth (1)
16	SJT347	Clip, Fuse (1)
17	SHR415	Pin, Lamp Case (2)
18	SHR9732	Holder, LCD (1)
19	SUW2873	Bracket, PCB (1)
20	SMX854	Spacer, PCB (1)
21	SJS5327	Socket, 3P (1)
22	SJS5421	Socket, 4P (2)
23	SJS5519	Socket, 5P (1)
24	SJS5903	Socket, 9P (1)
25 ⚠	SJA153	AC Cord (1)
26	SDU249−1	Filter (1)
27	SGP6330	Sub Panel (1)
28	SJE105	Cord (1)
29	SHR127	Bushing (1)
SCREW and WASHERS		
N1 Ⓢ	XTB3+8BFZ	Tapping, ⊕3×8 (4)
N2 Ⓢ	XTB3+8BFN	Tapping, ⊕3×8 (2)
N3 Ⓢ	XTB3+8BFN	Tapping, ⊕3×8 (4)
N4 Ⓢ	XTB3+12BFN	Tapping, ⊕3×12 (4)
N5 Ⓢ	XTB3+8BFZ	Tapping, ⊕3×8 (3)
N6 Ⓢ	XTB3+8BFZ	Tapping, ⊕3×8 (2)
N7 ○	SNE2095−4	Cabinet (4)
N7 Ⓚ	SNE2095−5	Cabinet (4)
N8 Ⓢ	XWG3	Washer, φ3 (2)
N9 Ⓢ	XTN3+10BFZ	Tapping, ⊕3×10 (2)
N10 Ⓢ	XTB3+6BFZ	Tapping, ⊕3×6 (1)
N11 Ⓢ	XTB3+8BFZ	Tapping, ⊕3×8 (2)
ACCESSORIES		
A2	SJP2129−5	Pin Cord (1)
A3	SSA901	FM ANT (1)
A4	SSA611−1	AM ANT (1)
A5	SMA231	Holder (1)
A6	SMA233−1	Holder (1)
A7	SQF12082	Instruction Book (1)
PACKING PARTS		
P1 ○	SPG4942	Carton Box (1)
P1 Ⓚ	SPG4939	Carton Box (1)
P2	SPS4470	Pad, Bottom (1)
P3	SPS4456	Pad, Left (1)
P4	SPS4457	Pad, Right (1)
P5 ○	SPP697	Polyethylene Bag (1)
P5 Ⓚ	SPP734	Polyethylene Bag (1)
P6	SPS4458	Pad, Upper (1)
P7	SPP691−1	Polyethylene Bag, Accessories (1)

■ EXPLODED V

A
B
C

A
B
C

■ EXPLODED VIEW

Description	
&	
Panel	(1)
Panel	(1)
parent Plate	(1)
parent Plate	(1)
Panel Ass'y	(1)
Ground	(1)
n, Selector	(1)
n, Input	
tor	(1)
n, Power	(1)
ection Rod,	
r	(1)
Lamp	(1)
et Ass'y	(1)
et Ass'y	(1)
sis Ass'y	
et)	(1)
	(4)
r, P.C.B.	(5)
nal, Output	(1)
et, Earth	(1)
Fuse	(1)
amp Case	(2)
r, LCD	(1)
et, PCB	(1)
r, PCB	(1)
t, 3P	(1)
t, 4P	(2)
t, 5P	(1)
t, 9P	(1)
ord	(1)
	(1)
anel	(1)
	(1)
ng	(1)
ng, ⊕3×8	(4)
ng, ⊕3×8	(2)
ng, ⊕3×8	(4)
ng, ⊕3×12	(4)
ng, ⊕3×8	(3)
ng, ⊕3×8	(2)
et	(4)
et	(4)
er, ϕ3	(2)
ng, ⊕3×10	(2)
ng, ⊕3×6	(1)
ng, ⊕3×8	(2)
ord	(1)
NT	(1)
NT	(1)
r	(1)
r	(1)
ction Book	(1)
n Box	(1)
n Box	(1)
Bottom	(1)
Left	(1)
Right	(1)
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Upper	(1)
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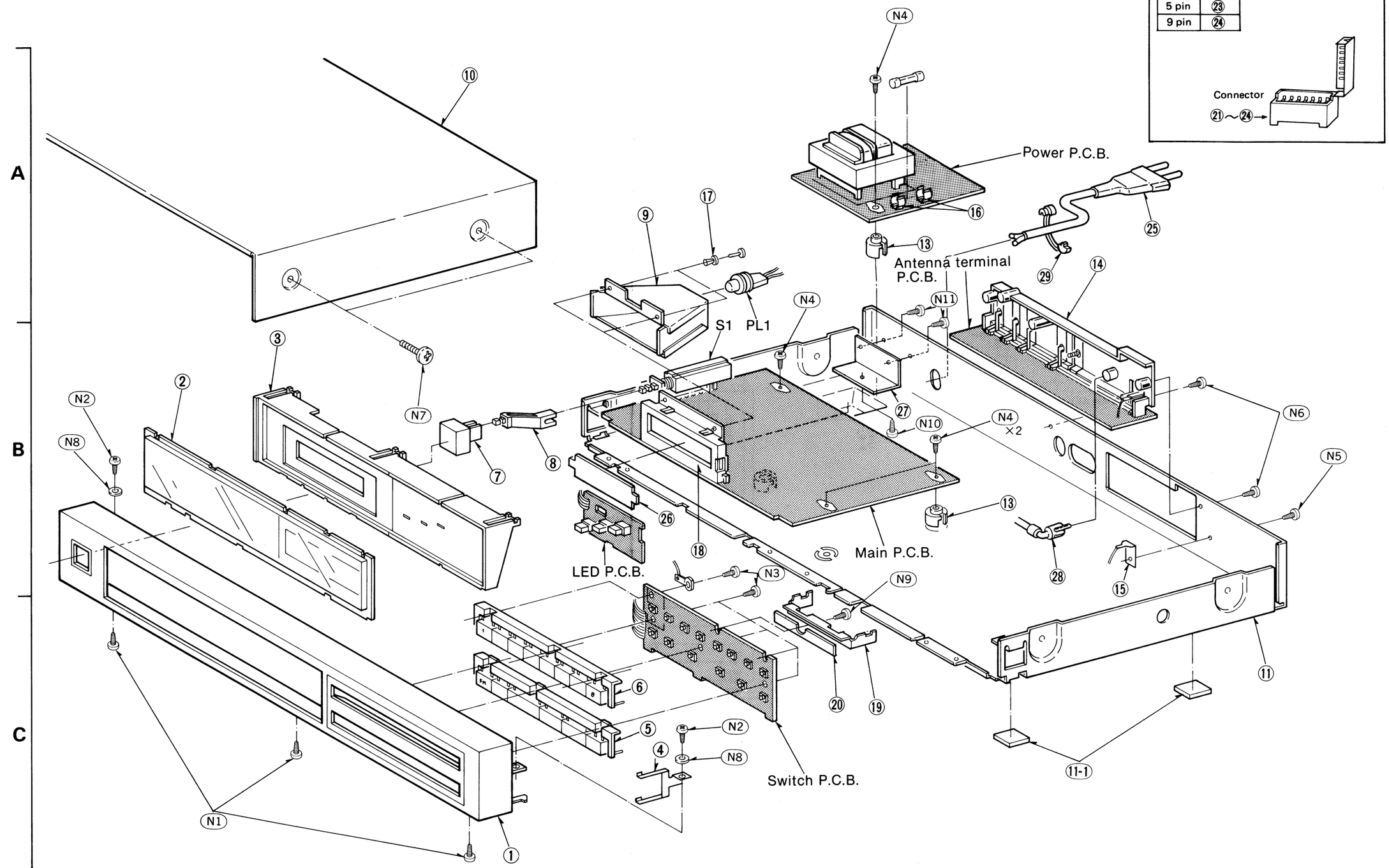
sories	(1)



| | | |

ORDER NO. HAD84122357S2

Service Manual

Supplement

QUARTZ Synthesizer
FM/AM Stereo Tuner

Tuner
ST-Z400

Color

(K)...Black Type
(S)...Silver Type

Color	Area
(K) (S)	[EGB]...F.R. Germany

Please use this manual together with the service manual for Model No. ST–Z400, Order No. HAD84102931C2.

■ REASON FOR CHANGE

- It is changed as follows because the FTZ standard is changed.

CHANGES

■ CHANGE OF THE DESTINATION MARK

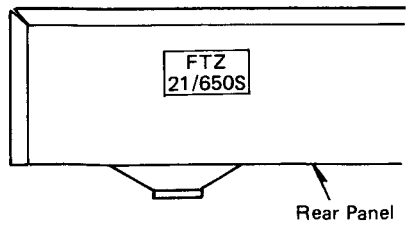
EGA ⟶ EGB

■ REPLACEMENT PARTS LIST

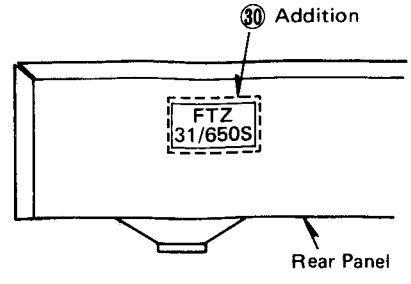
Ref. No.	Change of Part No. ST–Z400 [EGA]	Change of Part No. ST–Z400 [EGB]		Part Name & Description	Pcs/Set	Remarks
FM FRONT END						
	SNVFE407G22	SNVFE407G24		FM Front End Pack	1	Page 18
CABINET and CHASSIS PARTS						
30	Addition	SQX9276		Label, FTZ	1	*
ACCESSORY						
A7	SQF12082	SQF12082–2		Instruction Book	1	*

■ DISCRIMINATION OF EGA SET AND EGB SET

ST–Z400 [EGA]



ST–Z400 [EGB]



Technics

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